

SPECIFICATION

Docket No. DA9-92-108

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT WE, William J. Johnson and Michael D. Smith, are citizens of the United States of America residing in the State of Texas, have invented new and useful improvements in a

METHOD AND SYSTEM FOR CURSOR APPLIED PROCESSING WITHIN A DATA PROCESSING SYSTEM

of which the following is a specification:

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BACKGROUND OF THE INVENTION

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1. Technical Field:

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The present invention relates in general to an improved data processing system and in particular to a method and system for efficiently executing a predefined process within a data processing system. Still more particularly, the present invention relates to a graphical technique for executing a predefined process within the data processing system.

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2. Description of the Related Art:

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Data processing systems are becoming increasingly complex as technology and software become more complicated. As the complexity of such systems increases, it is of increasing importance to simplify the interface between a user and the data processing system in order to render execution of selected tasks within the data processing system more efficient, if possible.

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Recently selected software applications have been created which support the creation and utilization of user defined macros that may be applied within some context of that application. For example, modern word processing applications often permit a user to enter a "record" mode and thereafter specify a series of procedural steps which are to be recorded and executed each time the user invokes that macro. While such systems permit a user to define a macro or batch file for execution within a particular context of an application, no such procedure exists which permits a user to define a user specified process which may be applied to any number of arbitrarily selected user interface objects, such as icons, files, documents or the like, in an application independent manner.

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1 One reason that such known user defined macros are limited
2 to a single context is the difficulty in specifying the manner in which the
3 predefined processes which make up the macro are to be applied to a
4 particular object within the data processing system. It should thus be
5 apparent that a need exists for a technique whereby iterative processing of
6 objects within an electronic desktop may be efficiently performed and applied
7 to an arbitrary object within a data processing system.
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SUMMARY OF THE INVENTION

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2 It is therefore one object of the present invention to provide an
3 improved data processing system.

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5 It is another object of the present invention to provide an
6 improved method and system for efficiently executing a predefined process
7 within a data processing system.

8
9 It is yet another object of the present invention to provide a
10 graphical technique for executing a predefined process upon an arbitrary user
11 interface object within a data processing system.

12
13 The foregoing objects are achieved as is now described. The
14 method and system of the present invention may be utilized to efficiently
15 execute a predefined process within a data processing system having multiple
16 objects and a movable cursor element displayed therein. A user defined
17 executable process is specified within the data processing system which may
18 be applied to one or more arbitrary objects within the data processing
19 system. The user defined executable process is then associated with the
20 movable cursor within the data processing system. Thereafter, each time an
21 object is graphically selected within the data processing system utilizing the
22 movable cursor, the user defined executable process is applied to the
23 selected object. The physical appearance of the movable cursor is preferably
24 altered to indicate the association of the user defined executable process with
25 the movable cursor and an error message is returned in response to a
26 selection of an object which cannot be processed utilizing the user defined
27 executable process.

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1 The above as well as additional objectives, features, and
2 advantages of the present invention will become apparent in the following
3 detailed written description.
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BRIEF DESCRIPTION OF THE DRAWINGS

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The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 is a pictorial representation of a data processing system which may be utilized to implement the method and system of the present invention;

Figure 2 is a pictorial representation of a display screen within the data processing system of **Figure 1** which illustrates the display of a movable cursor and multiple user selectable objects which may be operated upon utilizing the method and system of the present invention;

Figure 3 is a pictorial representation of a display screen within the data processing system of **Figure 1** which illustrates the display of a movable cursor which has been graphically altered in appearance in response to an association of a user defined process with the movable cursor in accordance with the method and system of the present invention;

Figure 4 is a pictorial representation of the display screen within the data processing system of **Figure 1** which illustrates the display of a graphically altered movable cursor and the graphic selection of a particular user selectable object in accordance with the method and system of the present invention;

1 **Figure 5** is a pictorial representation of a display screen which
2 illustrates the display of a result of an execution of the user defined process
3 upon the graphically selected user selectable object in accordance with the
4 method and system of the present invention;

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6 **Figure 6** is a high level logic flowchart which illustrates the
7 specification of a user defined process to be utilized in accordance with the
8 method and system of the present invention;

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10 **Figure 7** is a high level logic flowchart which illustrates the
11 association of a user defined process with a movable cursor in accordance
12 with the method and system of the present invention; and

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14 **Figure 8** is a high level logic flowchart which illustrates the
15 execution of a user defined process upon a particular user selectable object
16 in response to a graphic selection of the object by a user utilizing a movable
17 cursor in accordance with the method and system of the present invention.

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DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

With reference now to the figures and in particular with reference to **Figure 1**, there is depicted a pictorial representation of a data processing system **10** which may be utilized to implement the method and system of the present invention. As illustrated, data processing system **10** includes a processor **12** and a keyboard **14**. As is typical in such data processing systems, a display device **16** is also coupled to processor **12** and includes a display screen **18**. A graphic pointing device **20**, such as a mouse pointer, is also coupled to processor **12** and may be utilized, as those skilled in the art will appreciate, to graphically select an element within display screen **18** in a manner well known in the art. Data processing system **10** may be implemented utilizing any so-called "personal" computer, such as the International Business Machines Corporation PS/2 personal computer.

Referring now to **Figure 2**, there is depicted a pictorial representation of a display screen **18** within data processing system **10** of **Figure 1** which illustrates the display of a movable mouse cursor **22** and multiple user selectable objects which may be operated upon utilizing the method and system of the present invention. As illustrated, multiple user selectable objects **24, 26, 28, 30, 32, 34, 36, 38, and 40** are displayed within display screen **18**. Such user selectable objects may comprise iconic representations of documents, files, folders, or the like. Similarly, those skilled in the art will appreciate that such user selectable objects may also comprise iconic representations of selected applications or utilities within data processing system **10**. Each user selectable object within display screen **18** may, as those ordinarily skilled in the art will appreciate, be graphically selected, utilizing graphic pointing device **22** by physically locating movable mouse cursor **22** above a particular user selectable object and thereafter

1 "clicking" or otherwise selecting the object utilizing a mouse button or other
2 similar input device.

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4 With reference now to **Figure 3**, there is depicted a pictorial
5 representation of display screen **18** of **Figure 2** within data processing
6 system **10** of **Figure 1** which illustrates the display of a movable cursor which
7 has been graphically altered in appearance in response to an association of
8 a user defined process with the movable cursor in accordance with the
9 method and system of the present invention. As illustrated, the appearance
10 of movable mouse cursor **22** has been graphically altered and is now
11 depicted as graphically altered mouse cursor **42**. Those having ordinary skill
12 in this art will appreciate that any suitable graphical technique for indicating
13 the association of a user defined process may be utilized to indicate that
14 association and that the shape, color or physical appearance of movable
15 mouse cursor **22** may be suitably altered to indicate that association. In the
16 depicted embodiment of the present invention, the user defined process may
17 comprise, for example, a specification of a particular series of alphanumeric
18 characters which are to be searched for within a file listing represented by a
19 selectable object within display screen **18**.

20

21 Thus, if the user desires to examine each user selectable object
22 within display screen **18** to locate each file or document having the letters "P,"
23 "R," "O," "L," within the file name, a simple procedure may be defined for
24 specifying that process. In a manner which will be explained in greater detail
25 herein, that user defined process may be created and stored and thereafter
26 selected for association with movable mouse cursor **22** to create graphically
27 altered mouse cursor **42** in the manner depicted within **Figure 3**.

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1 Next, referring to **Figure 4**, there is depicted a pictorial
2 representation of display screen **18** within data processing system **10** of
3 **Figure 1**, which illustrates the display of a graphically altered movable cursor
4 and a graphic selection of a particular user selectable object in accordance
5 with the method and system of the present invention. Thus, as illustrated
6 within **Figure 4**, graphically altered mouse cursor **42** has been moved to a
7 position overlying user selectable object **26**. In this manner, as will be
8 explained in greater detail below, the user defined process associated with
9 graphically altered mouse cursor **42** will then be applied to user selectable
10 object **26** upon the graphic selection of user selectable object **26**, utilizing
11 graphically altered mouse cursor **42**. Thus, the graphic selection and
12 "clicking" on user selectable logic **26** utilizing graphically altered mouse cursor
13 **42** will result in the execution of the selected user defined process on the
14 contents of that user selectable object.

15
16 With reference now to **Figure 5**, there is depicted a pictorial
17 representation of a display screen **18** within data processing system **10** of
18 **Figure 1**, which illustrates the display of a result of an execution of the user
19 defined process upon the graphically selected user selectable object, in
20 accordance with the method and system of the present invention. Thus, as
21 illustrated within **Figure 5**, a search results listing **44** has been created which
22 lists each file within user selectable object **26** which satisfies the search
23 criteria set forth within the predefined process which has been selected by
24 the user.

25
26 In this manner, as those ordinarily skilled in the art will
27 appreciate, a user predefined process may be created and associated with
28 a movable mouse cursor and thereafter executed upon any arbitrarily
29 selected object within the data processing system by the simple expedient of

1 graphically selecting a user selectable object utilizing the graphically altered
2 mouse cursor. Of course, in the event the object selected is inappropriate
3 for execution of the user defined process, an error message may be
4 generated and returned to the user.

5

6 Referring now to **Figure 6**, there is depicted a high level logic
7 flowchart which illustrates the specification of a process to be utilized with the
8 method and system of the present invention. As depicted, the process
9 begins at block **60** and thereafter passes to block **62**. Block **62** illustrates a
10 determination of whether or not the user desires to define a process and if
11 not, the process merely returns in an iterative fashion to await the initiation of
12 the creation of a user defined process in accordance with the method and
13 system of the present invention.

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15 Still referring to block **62**, in the event the user does desire to
16 define a process, the process passes to block **64**. Block **64** illustrates the
17 entering of a process definition state. Those ordinarily skilled in the art will
18 appreciate that a procedure may be created for specifying process definition
19 and executed utilizing a so-called "Terminate and Stay Resident" (TSR)
20 processing technique. That is, a process which is initiated utilizing a so-called
21 "hot key" and which thereafter interprets keystrokes which follow the
22 invocation of that procedure as keystrokes which are to be recorded for
23 future utilization, rather than passed directly to the data processing system.

24

25 Next, the process passes to block **66** which illustrates the
26 capture and storing of the keystrokes and other selected inputs, such as
27 mouse movements or the like. Thereafter, the process passes to block **68**.
28 Block **68** illustrates a determination of whether or not the process definition

1 has ended and if not, the process returns to block 66 to continue to capture
2 keystrokes and selected user inputs.

3

4 Once the process definition has ended, as determined at block
5 68, the process passes to block 70. Block 70 illustrates the storing of the
6 defined process and the process then passes to block 72. Block 72
7 illustrates a determination of whether or not a second user defined process
8 is to be defined and if so, the process returns to block 64 in an iterative
9 fashion to begin the process definition procedure for a second user defined
10 process. In the event no other process is to be defined, this procedure
11 passes to block 74 and returns. A user may desire to utilize existing
12 processes, such as macros, batch files, programs or the like. In such
13 circumstances, the process detailed in Figure 6 will not be necessary.

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15 With reference now to Figure 7, there is depicted a high level
16 logic flowchart which illustrates the association of a user defined process with
17 a movable cursor in accordance with the method and system of the present
18 invention. As illustrated, this process begins at block 80 and thereafter
19 passes to block 82. Block 82 illustrates a determination of whether or not
20 cursor applied processing has been selected. If not, the process merely
21 iterates until such time as the user selects a cursor applied processing
22 procedure. Once the cursor applied processing procedure has been
23 selected, the process passes to block 84. Block 84 illustrates the prompting
24 of the user to select a predefined process. Recalling that the user may
25 predefine and store numerous processes, it should be clear to those having
26 ordinary skill in the art that the user may select one of several predefined
27 processes for utilization with the cursor applied processing process. It should
28 be noted that a reference to one or more existing processes such as macros,
29 batch files, programs or the like, may be utilized in lieu of the creation of a

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1 process as outlined in **Figure 6** above. Next, the process passes to block
2 **86**. Block **86** illustrates a determination of whether or not the user has
3 responded to the prompt by selecting a predefined process. If not, the
4 process passes to block **88** which illustrates the generation of an error
5 message and the process returns to block **84** in an iterative fashion.

6
7 Still referring to block **86**, in the event the user has selected a
8 predefined process for utilization with the cursor applied processing
9 procedure, the process passes to block **90**. Block **90** illustrates the
10 association of that predefined process with the movable cursor. Next, the
11 process passes to block **92** which illustrates the alteration of the graphical
12 appearance of the movable cursor in order to indicate to the user that a
13 predefined process has been associated with that cursor. Thereafter, the
14 process passes to block **94** and returns. Error handling of an invalidly
15 specified process may be accomplished utilizing any technique known in the
16 art.

17
18 Finally, referring to **Figure 8**, there is depicted a high level logic
19 flowchart which illustrates the execution of a user defined process upon a
20 particular user selectable object in response to a graphic selection of that
21 object by a user utilizing the movable cursor, in accordance with the method
22 and system of the present invention. As illustrated, this process begins at
23 block **100** and thereafter passes to block **102**. Block **102** illustrates a
24 determination of whether or not the cursor has been utilized to graphically
25 select an object within display screen **18**. In the event the cursor has not
26 been utilized to select an object, the process returns, in an iterative fashion,
27 to await selection by the user of an object within the display screen utilizing
28 the movable mouse cursor. Next, the process passes to block **104**.
29

1 Block 104 illustrates a determination of whether or not the
2 system is currently operating within the cursor applied processing mode and
3 if not, the process passes to block 106 which illustrates the normal selection
4 procedure. That is, that procedure which occurs normally when an object
5 which has been graphically selected by the cursor is selected during normal
6 processing. Thereafter, the process passes to block 108 and returns.

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8 Referring again to block 104, in the event the data processing
9 system is operating within the cursor applied processing mode, the process
10 passes to block 110. Block 110 illustrates a determination of whether or not
11 the object which has been selected is suitable for the selected predefined
12 process. Those ordinarily skilled in the art will appreciate that in view of the
13 fact that numerous user processes may be predefined, there may exist
14 selectable objects within the data processing system which are not suitable
15 for execution by a particular process. In the event the object selected is not
16 suitable for the selected process, the process passes to block 112 which
17 illustrates the generation of an error message. Thereafter, the process
18 passes to block 108 and returns.

19

20 Referring again to block 110, in the event the object selected by
21 the user utilizing the mouse cursor is suitable for the selected process, the
22 process passes to block 114 which illustrates the execution of the selected
23 process on the graphically selected object in response to a graphic selection
24 of that object utilizing the movable mouse cursor. Next, the process passes
25 to optional block 116 which illustrates the returning and display of the results
26 of that process execution, if necessary or desired, and the process then
27 passes to block 108 and returns.

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1 The movable mouse cursor, of course, remain enabled within
2 the cursor applied processing mode after selection of that mode as noted in
3 **Figure 7** until the user elects to disable that mode. After disabling the cursor
4 applied processing mode, the appearance of the movable mouse cursor will
5 be restored to a normal graphic appearance and will thereafter operate
6 normally.

7
8 Upon reference to the foregoing those skilled in the art will
9 appreciate that the Applicants herein have created an intuitive and graphic
10 technique whereby a user defined process may be created and thereafter
11 associated with a movable cursor element and then applied to an arbitrary
12 number of user selectable objects within a data processing system by the
13 simple expedient of graphically selecting an object utilizing a movable cursor
14 which has had a predefined user process associated therewith.

15
16 While the invention has been particularly shown and described
17 with reference to a preferred embodiment, it will be understood by those
18 skilled in the art that various changes in form and detail may be made therein
19 without departing from the spirit and scope of the invention.

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